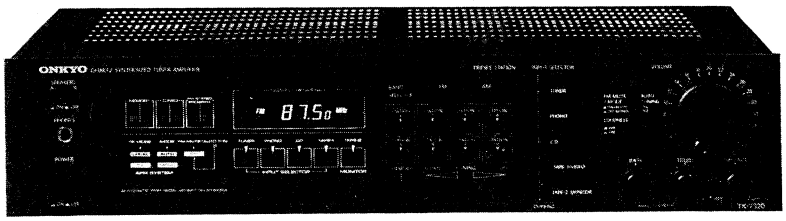
TX-7320

SERIAL NO. 3225

ONKYO SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-7320



Black and Silver models

BUGV, UGV	220V AC, 50Hz

SAFETY-RELATED COMPONENT WARNING!!
COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

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ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power output:	30 watts per channel,min RMS,at 8 ohms, both channels driven,from 40Hz to 20kHz, with no more than 0.3% THD.	
Musical Power Output:	2 ×72 watts at 4 ohms,1kHz (DIN)	
	2 ×52 watts at 8 ohms,1kHz (DIN)	
Continuous Power Output:	2 ×40 watts at 4 ohms,1kHz (DIN)	
	2 ×33 watts at 8 ohms,1kHz (DIN)	
Total Harmonic Distortion:	0.1% at 25W	
	0.1% at 1 watt output	
IM Distortion:	0.1% at 25W	
	0.1% at 1 watt output	
Damping Factor:	35 at 8 ohms	
Frequency Response:	20-30,000Hz ± 1dB	
RIAA Deviation:	20-20,000Hz ±0.8dB	
Sensitivity and Impedance:	Phono:	2.5mV/50kohms
	CD/Tape Play:	150mV/50kohms
	Tape Rec:	150mV/3.5kohms (Phono)
Phono overload:	150mV RMS at 1kHz,0.3% THD	
Signal-to-Noise Ratio:	Phono:	85dB(at 10mV input, A weighted)
		75dB(IHF A-202)
	CD/Tape:	95dB(A weighted)
		80dB(IHF A-202)
Tone Controls:	Bass:	± 10dB at 100Hz
	Treble	± 10dB at 10kHz
Loudness(-30dB):	+7dB at 70Hz, +5dB at 10kHz	

TUNER SECTION

FM:

Tuning Range:	87.50-108.00MHz(50kHz steps)	
Usable Sensitivity:	Mono:	12.4dBf, 2.3μV,
		IHF 1.2 μV,
		75 ohms DIN
	Stereo:	2.5 μV,75 ohms
50dB Quieting Sensitivity:	Mono:	2.2 μV,75 ohms
	Stereo:	22μV,75 ohms
Capture Ratio:	1.5dB	
Image Rejection Ratio:	80dB	
IF Rejection Ratio:	90dB	
Signal-to-Noise Ratio:	Mono:	70dB
	Stereo:	65dB
Selectivity:	50dB DIN (±300kHz,40kHz Devi.)	
AM Suppression Ratio:	50dB	
Harmonic Distortion:	Mono:	0.15%
	Stereo:	0.30%
Frequency Response:	30-15,000Hz ±1.5dB	
Stereo Separation:	40dB at 1kHz	
	30dB at 100-10,000Hz	
Muting level:	17.2dBf, 2μV	
Stereo Threshold:	17.2dBf, 2μV	

AM:

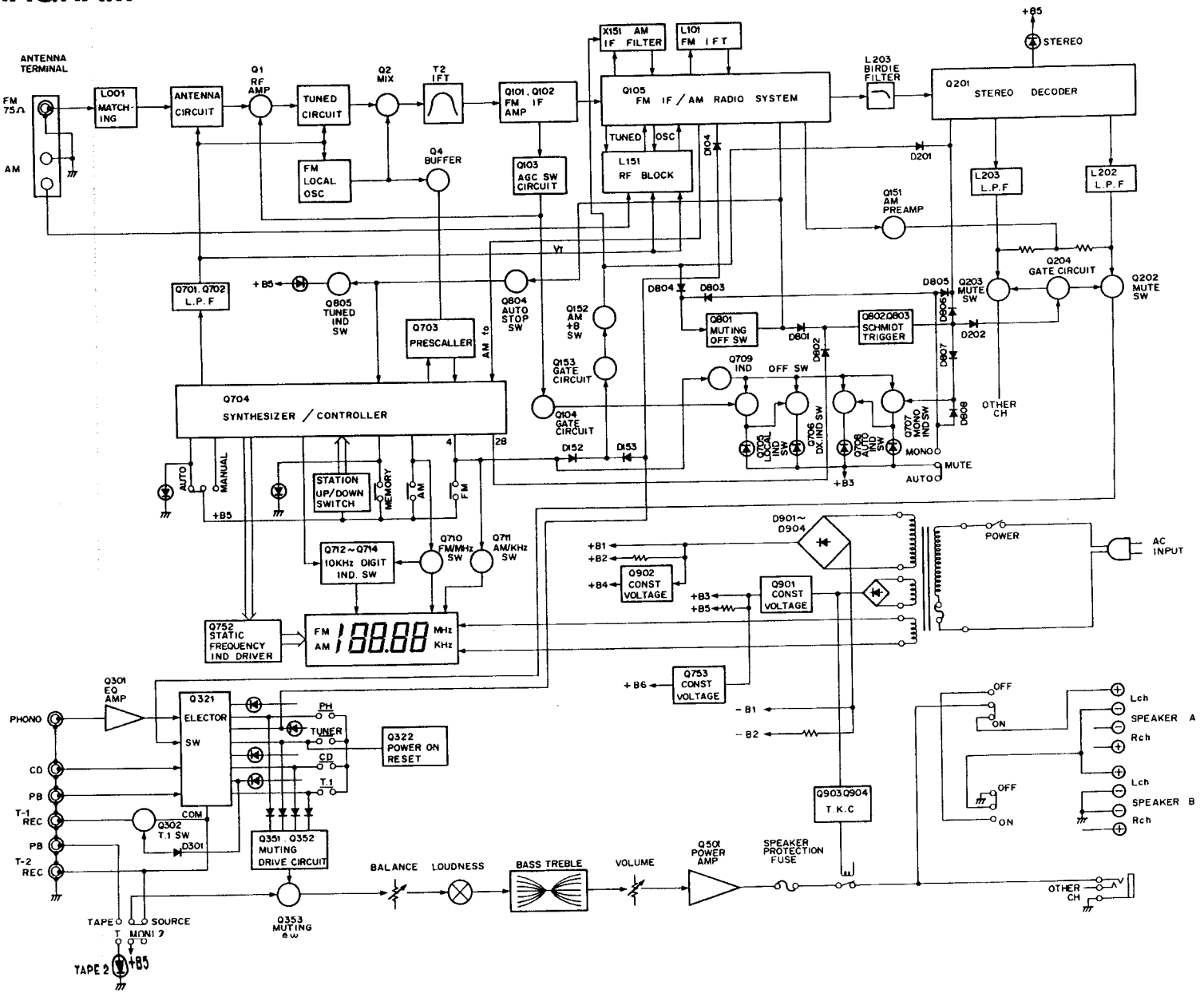
Tuning Range:	522-1,611kHz(9kHz steps)
Usable Sensitivity:	30μV
Image Rejection Ratio:	40dB
IF Rejection Ratio:	30dB
Signal-to-Noise Ratio:	40dB
Harmonic Distortion:	0.8%

GENERAL

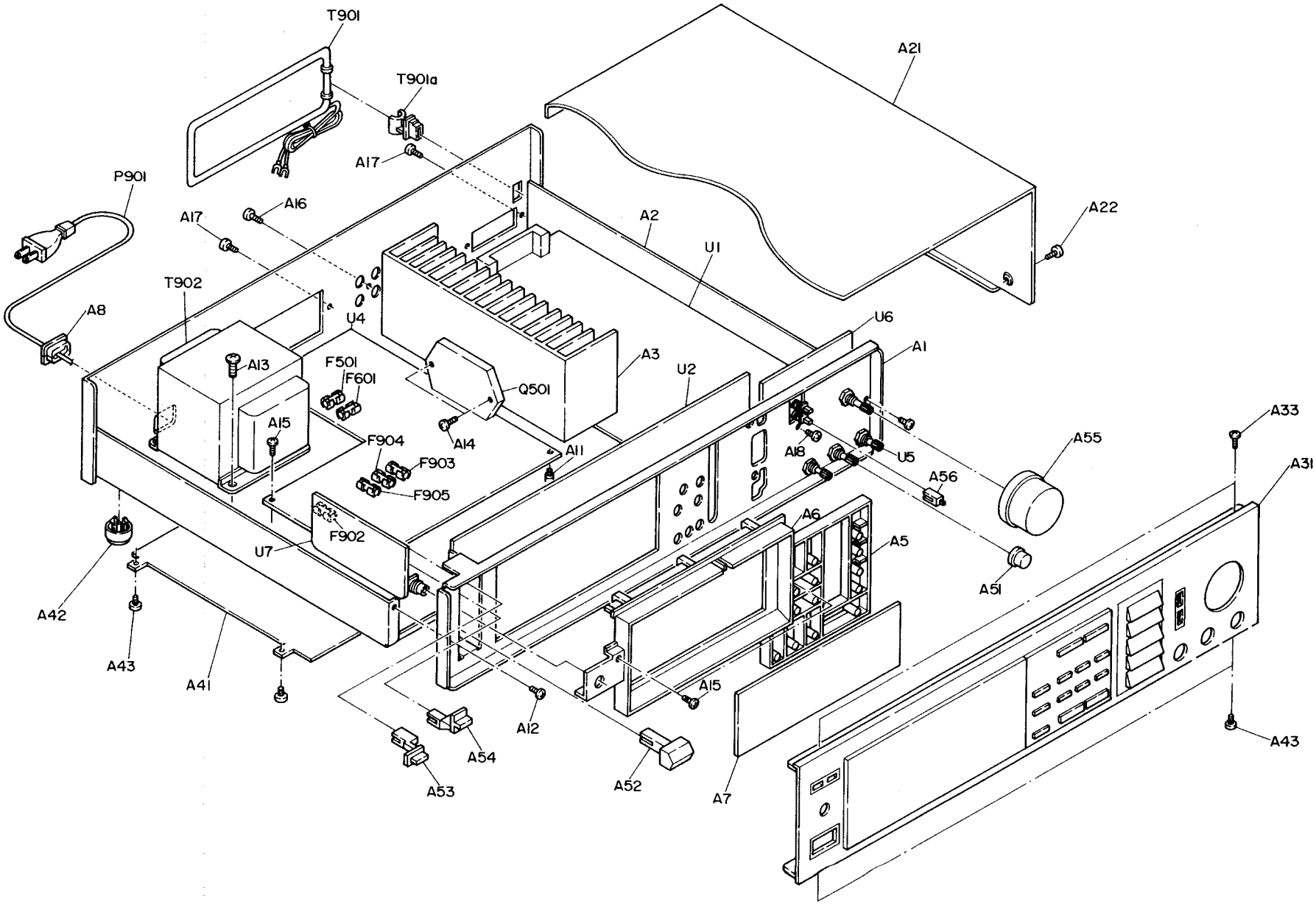
Dimensions(W×H ×D):	435 ×97×317mm
	17-1/8" ×3-15/16"×12-1/2"
Weight:	5.7kg.,12.6lbs.

Specifications and features are subject to change without notice.

BLOCK DIAGRAM



EXPLODED VIEW



PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A1	27110273	Front bracket
A2	27100091A	Chassis
A3	27160183	Radiator
A5	28322486	Holder, Knob
A6	2719345B	Holder
A7	28133161	Back palte
A8	27300750	Strainrelief
A11	27190266	Holder
A12	834430068	3TTS+6B(BC), Tapping screw
A13	830440089	4TTC+8C(BC), Tapping screw
A14	834430168	3TTS+16B(BC), Tapping screw
A15	831130088	3TTW+8B, Tapping screw
A16	834230108	3TTS+10B(Ni), Nickel screw
A17	834430108	3TTS+10B(BC), Tapping screw
A18	82143006	3P+6FN(BC), Pan head screw
A21	28184267	Top cover <S>
	28184268	Top cover <B>
A22	834430068	3TTS+6B(BC), Tapping screw
A31	18662121	Front Panel ass'y <S>
	18672121	Front panel ass'y <B>
A33	838430068	3TTB+6B(BC), Tapping screw
A41	27170223	Bottom board
A42	27175130	Leg
A43	834430068	3TTS+6B(BC), Tapping screw

REF. NO.	PART NO.	DESCRIPTION
A51	28322008	Knob, Balance <S>
	28322021-1	Knob, Balance <B>
A52	28322487	Knob, Power <S>
	28322488	Knob, Power <B>
A53	28322469	Knob, Speaker A <S>
	28322304-1	Knob, Speaker A <B>
A54	28322470	Knob, Speaker B <S>
	28322305-1	Knob, Speaker B <B>
A55	28321887A	Knob, Yolume <S>
	28322194	Knob, Yolume <B>
A56	28322467A	Knob, Loudness <S>
	28322481A	Knob, Loudness <B>
F501, F601	252075	2.5A-SE-EAK, Speaker fuse
F902	252073 or	1.6A-SE-EAK, Primary fuse
	252073CC	
F903, F904	252077	4A-SE-EAK, Secondary fuse
F905	252070	1A-SE-EAK, Secondary fuse
P901	253128 or	AS-CEE, Power supply cord
	253130	
Q501, Q601	222044	STK-4151V, Power amplifier IC
T901	232119	NMA-3052, AM loop antenna
T901a	27190105	Holder, antenna
T902	2300077	NPT-912G, Power transformer

REF. NO.	PART NO.	DESCRIPTION
U1	18664592-1A	NARF-2592-1A, FM/AM tuner pc board ass'y
U2	18664593-1A	NADIS-2593-1A, Display circuit pc board ass'y
U4	18664595-1A	NAAF-2595-1A,Pri. and main amplifier pc board ass'y
U5	18668596-1	NATC-2596-1, Tone control circuit pc board ass'y
U6	18668597-1	NAVR-2597-1, Volume control pc board ass'y
U7	18668598-1	NAHP-2598-1, Headphone terminal pc board ass'y

NOTE: THE COMPONENTS IDENTIFIED BY MARK⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

CIRCUIT DESCRIPTIONS

1.Synthesizer and controller operation

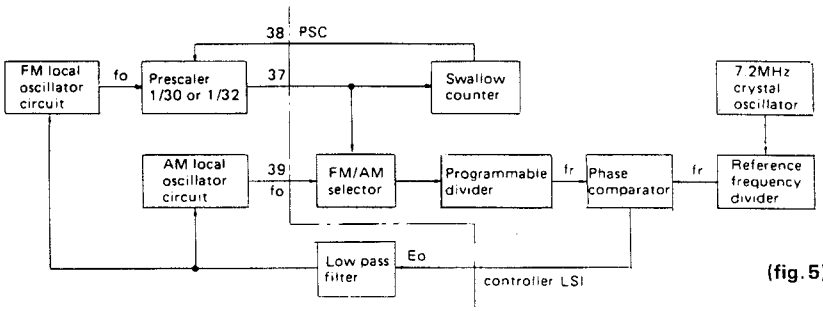
Pin No.	Symbol	Terminal	Description
1	GND	Ground	
2	XT	X'tal	Connected to the 7.2MHz crystal oscillator for the reference frequency.
3	XT		
4	FM	FM band specification input	Mutual reset type,performs switching of each band.FM/MW/LW.
5	MW	MW band specification input	
6	LW	LW band specification input	
7	MANUAL	Manual tuning mode specification input	Mutual reset type,performs auto search and manual operation mode switching during UP/DOWN tuning.
8	AUTO	Auto search tuning mode specification input	
9	UP	UP tuning key input	Connect the push key and perform UP/DOWN tuning.
10	DOWN	DOWN tuning key input	
11	STO	Memory store command input	The preset memory is set to the write mode when the key is pressed.
12~19	M1~M8	Preset memory channel specification input	Controls the write and read out of the internal 16-station preset memory along with the MC1 and MC2 input.
20	MC-1	Memory control input	Set the 16-station preset memory to the 8 FM/8 AM station mode or the FM/AM 2-band 16-station random mode.The 16-station random mode is used in this unit.
21	MC-2		
22	OSC2	AM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the AM search mode.
23	OSC1	FM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the FM search mode.
24	0/5	FM 50kHz output	Output that represents the 50kHz FM band tuning step for European models. Goes to the high level for the 50kHz setting.
25	CK2	Tuned frequency data output	Outputs the serial data and timing clock to the tuned frequency display driver.
26	CK1		
27	DATA		
28	MUTE	Muting signal output	Goes to the high level during muting output.
29	E2	Region specification input	See table 1.
30	E1		
31	STOP 3	AM IF signal input	During AM reception, this counts the IF signal and stops auto search.
32	STOP 2	Auto search stop signal input	When the stop 1 input (pin 33) is at the high level and this terminal goes to the high level, auto search is stopped.
33	STOP 1	Scan speed slow input	When the high level is input at this terminal, the auto search speed is cut in half.

Pin No.	Symbol	Terminal	Description
34	DO 1	Error output	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided oscillation frequency is high than the reference frequency.In the opposite case, low level is output. Floating occurs when the frequencies match.The output is applied to the variable capacitor diode in the front end through low pass filter Q701 and Q702.The output from both terminals is the same, but only DO1 is used.
35	DO 2		
36	TEST	Test terminal	Test mode at the high level.
37	FM IN	FM programmable counter input	Connect to the prescaler output(pin 3 of Q703)
38	PSC	Pulse swallow control output	Output to the control the division ratio of the prescaler.
39	AM IN	AM local oscillator signal input	Terminal for input of AM local oscillator signal.
40	INH	Inhibit input	Operates normally at the high level.Inhibit status at the low level.
41	INT	Initialize input	Operates normally at the high level.At the low level,the internal status is initialized.
42	Vdd	Power supply	Device power terminal:supplies 5V during the normal operation and 2.5V from the super capacitor (C715) for the memory preservation.

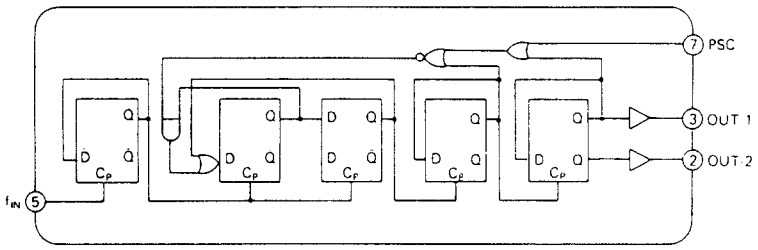
Table 1

E1 (Pin 30)	E2 (Pin 29)	Region	Band	Frequency range	Intermediate Frequency	Scan step	Reference Frequency
0	1	U.S.A	FM	87.5~108.0MHz	+10.7MHz	100kHz	25kHz
			AM 1	520 ~1710kHz	+450kHz	10kHz	10kHz
1	1		AM 2	522 ~1710kHz	+450kHz	9kHz	9kHz
1	0	Europe	FM	87.50 ~108.00MHz	+10.7MHz	50kHz	25kHz
			MW	522 ~1611kHz	+450kHz	9kHz	9kHz
			LW	153 ~360kHz	+450kHz	1kHz	1kHz
0	0	Japan	FM	76.0~90.0MHz	-10.7MHz	100kHz	25kHz
			AM	522 ~1611kHz	+450kHz	9kHz	9kHz

2.PLL tuned circuit



(fig.5)



TD6104P (Prescaler)

A block diagram of the tuned of the PLL is shown in fig. 5.

Operation during AM reception

The reception frequency is applied to the programmable divider where it is divided to 1/N and output as fv.This is applied to the phase comparator where it is comparated with frequency reference fr(9kHz for G/W models and 10kHz for D model). If fr and fv differ, Eo equal to the difference in frequency is output.Since error output Eo is a pulse waveform, it is passed through the low pass filter to change it into DC voltage Vd,which is applied to the variable capacitor diode in the front end to change the reception frequency.This continues until fv and fr are the same and Eo=0.

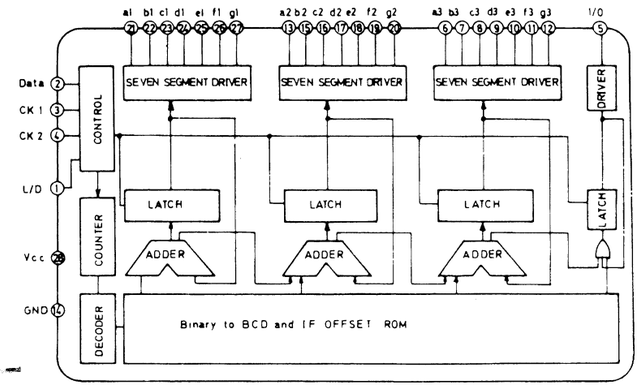
Operation during FM reception

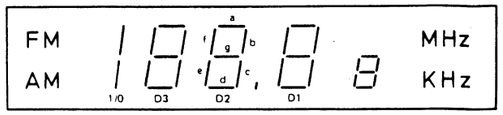
The pulse swallow method is used in the prescaler of this unit. In this type of prescaler, a supplementary number (changed accordimg to the program code input) and the divided reception frequency from the prescaler are combined in the control counter and the prescaler's division factor is switched 1/30 or 1/32 according to external control(1/32 when the PSC terminal is "H" and 1/30 when it is "L").

The station oscillator frequency is applied to the programmble divider,but the programmable divider has an upper frequency limit of only 30MHz,so the pulse swallow-type prescaler,which can be used up to 150MHz,is inserted for division to 1/Np;

The signal is applied to the programmable divider and divided to 1/N. The result is compared with a 25kHz frequency reference in the phase detector and error is output as Eo until a match is obtained as in AM operation.

3. Frequency indicator circuit



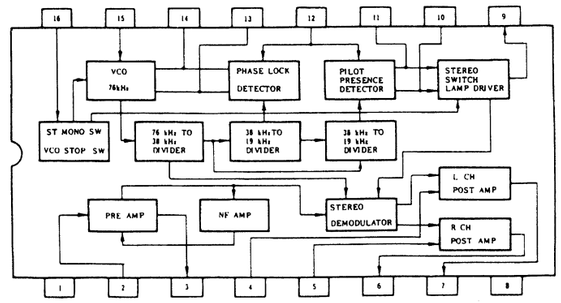


TD6301AP block diagram

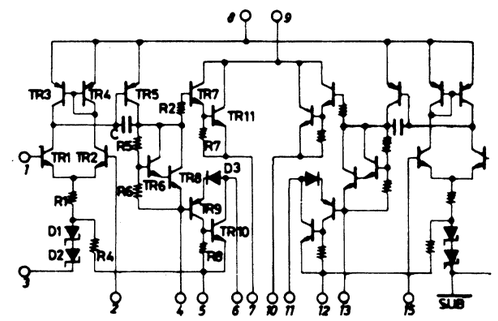
Pin No.	Terminal	Description
1	L/D	Output indication switching input terminal:Fluorescent display at the low level,and LED display at the high level.
2	Data	Tuned frequency data input terminal:Input from the system controller LSI to the serial.
3,4	CK1 CK2	Tuned frequency data input control timing input terminal: Transferred simultaneously with data from the system controller LSI.
5	I/O	Segment drive output terminal:Sets the number of display digit for FM(100MHz) and AM(1000kHz) reception.
6-12	a3-g3	Seven segment drive output terminal:Sets the number of display digit for FM(10MHz) and AM(100kHz) reception.
13, 15-20	a2-g2	Seven segment drive output terminal:Sets the number of display digit for FM(1MHz) and AM(10kHz) reception.
21-27	a1-g1	Seven segment drive output terminal:Sets the number of display digit for FM(100kHz) and AM(1kHz) reception.
14	Vcc	Power source terminal
28	Gnd	Ground

BLOCK DIAGRAM OF IC

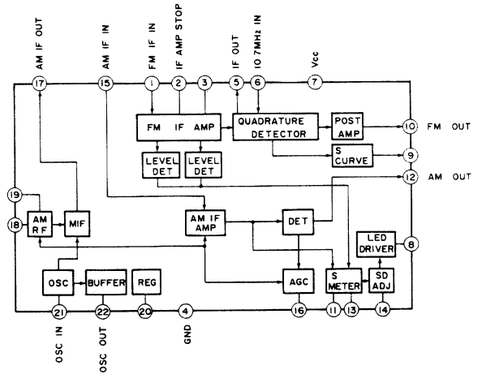
μPC1161C3(Stereo decoder)



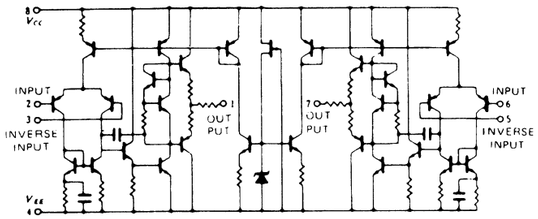
STK-4151V(Power amplifier)



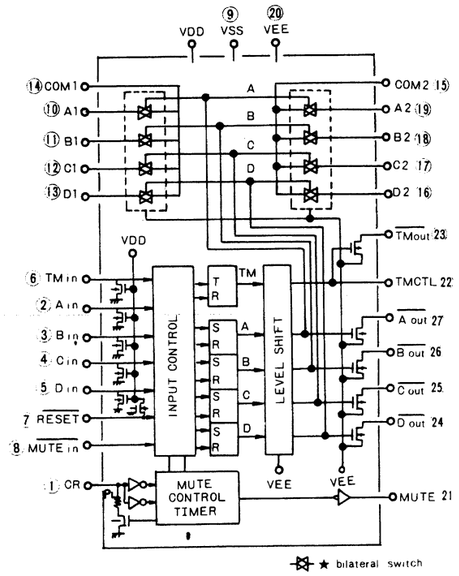
LA1265(AM radio/FM IF system)



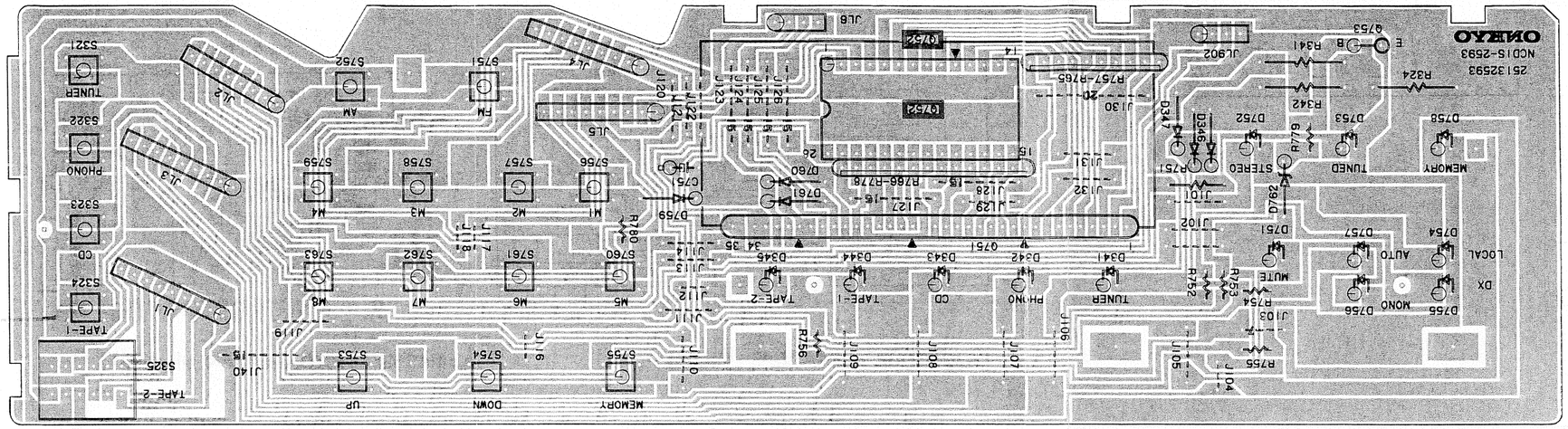
NJM4558/4559(Operational amplifier)



LC7817(Analog switch)

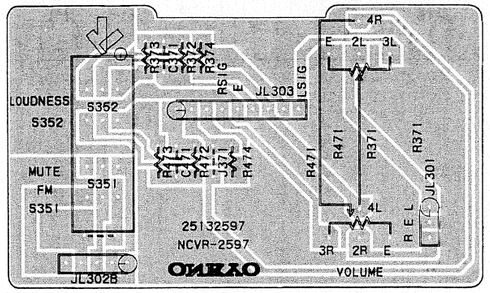


PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

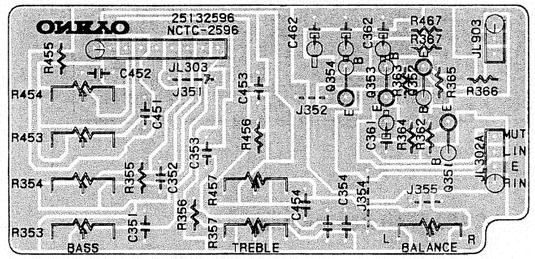


DISPLAY CIRCUIT PC BOARD

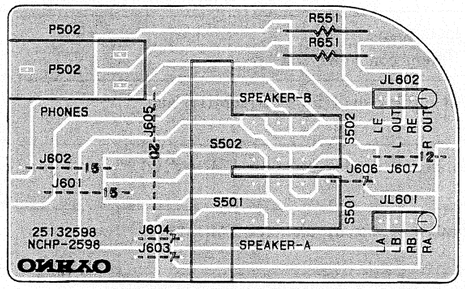
HEADPHONE TERMINAL PC BOARD



TONE CONTROL PC BOARD



VOLUME CONTROL PC BOARD



DISPLAY PC BOARD(NADIS-2593-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Fluorescent tube	
Q751	212016	FIP7B8CS
	IC	
Q752	222673	TD6301AP
	Transistor	
Q753	2211455,	2SA1015(GR),
	2210803 or	2SA733(P) or
	2212495	JA101(Q)
	L.E.Ds	
D341-D344	225137CG,	SEL2413ECG,
D751,D753	225137DG or	SEL2413EDG or
D754,D757	225137DY	SEL2413EDY
D345,D755	225142	SEL2913K
D756	225142	SEL2913K
D752,D758	225141	SEL2213C
	Diodes	
D346-D348	223150,	1S1040,
D759	223124 or	1S2473 or
	223145	1S2076TD
D760,D761	223150,	1S1040,
	223124 or	1S2473 or
	223145	1S2076TD
D762	2243192 or	MTZ8.2A or
	2239552	RD8.2E-B2
	Capacitor	
C751	352741009	10μF,16V,Elect.
	Resistors	
R341,R342	441522024	2kohm,1/2W,Metal oxide film
R343	441628214	820ohm,1/2W,Metal oxide film
R757-R765	49121333409	33kohm×9,1/8W,Network
R766-R778	49121333413	33kohm×13,1/8W,Network
	Switches	
S321-S324	25035389	NPS-111-S353
S325	25035515	NPS-142-L477
S751-S763	25035389	NPS-111-S353
	Holder	
	27190434	L.E.D
	Cushion	
	28140593	3.5 ×10×40mm

PRINTED CIRCUIT BOARD-PARTS LIST

HEADPHONE TERMINAL PC BOARD(NAHP-2598-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
R551,R661	441522714	270ohm,1/2W,Metal oxide film resistor
S501,S502	25035517	NPS-222-L479,Push switch,Speaker
P502	25045184	HJL-0520-01-010,Headphone terminal <G/W>

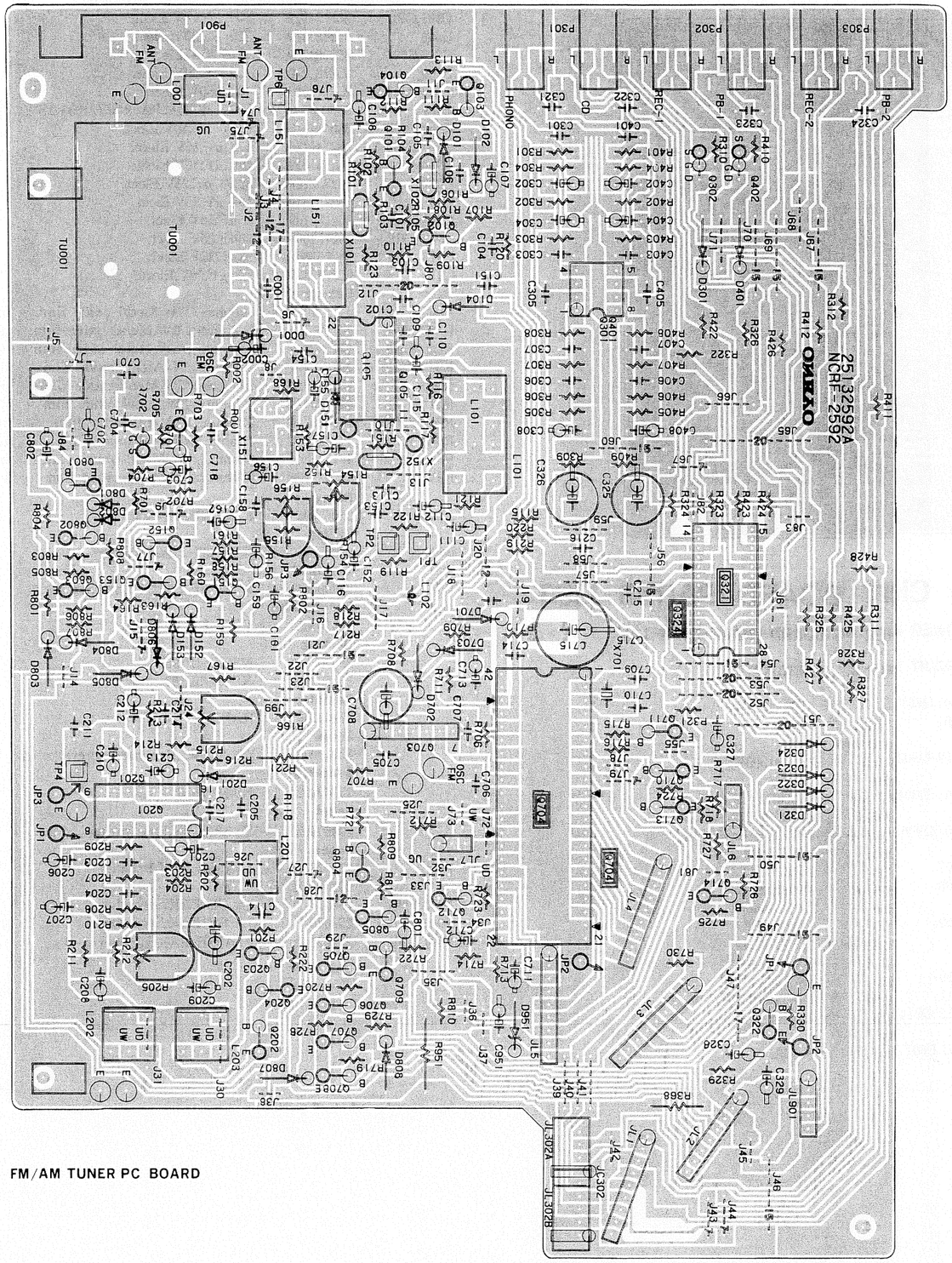
TONE CONTROL PC BOARD(NATC-2596-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Transistors	
Q351	2211255,	2SC1815(GR),
	2210746 or	2SC945A(P) or
	2212485	JC501(Q)
Q352	2211455,	2SA1015(GR),
	2210803 or	2SA733(P) or
	2212495	JA101(Q)
Q353,Q354	2212285 or	2SC2878(A) or
	2212286	2SC2878(B)
	Capacitors	
C361	352780109	1 μF,50V,Elect.
C362,C462	352781099	0.1 μF,50V,Elect.
	Resistors	
R352	5146049	N16RLC250KWT30,Variable,Balance
R353,R453	5148073	N16RQMC110K180K30,Variable,Bass
R357,R457	5148102	N16RGMC219K30,Variable,Treble

VOLUME CONTROL PC BOARD(NAVR-2597-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
R371,R471	5104180	N16RGH100KBT30,Variable resistor,
	Volume	
S351,S352	25035520	NPS-222-L482,Push switch

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



FM/AM TUNER PC BOARD

PRINTED CIRCUIT BOARD–PARTS LIST

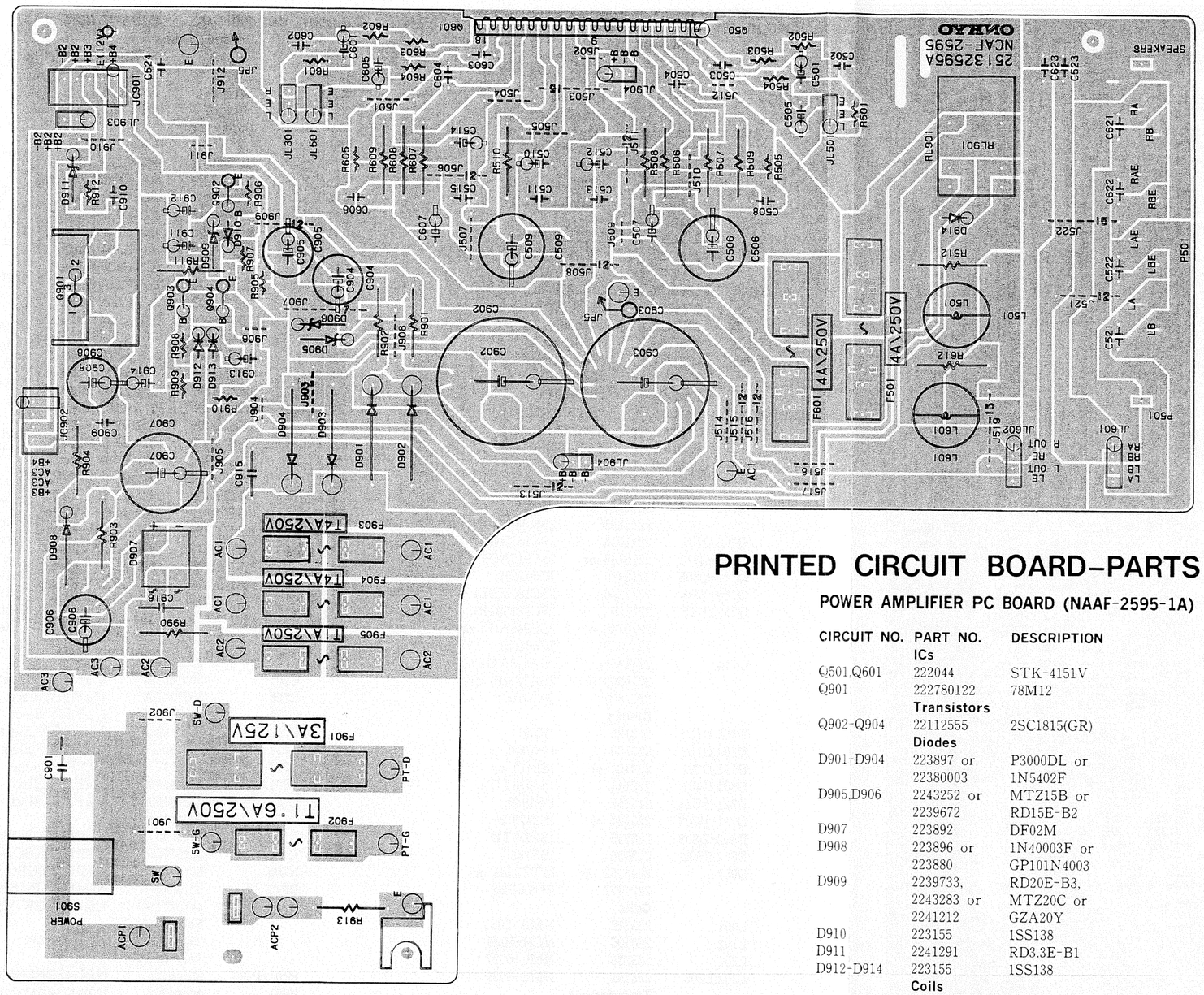
FM/AM TUNER PC BOARD(NARF-2592-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240059	FE416U33
	ICs	
Q105	222912	LA-1265
Q201	222678	μPC1161C3
Q301,Q401	222502 or	NJM4558DX or
	222534	NJM4559DX
Q321	222923	LC7816
Q703	222675	TD6104P
Q704	222674	TC9147BP
	Transistors	
Q101	2211722 or	2SC1923(R) or
	2211723	2SC1923(O)
Q102	2210746	2SC945A(P)
Q103,Q104	2211255,	2SC1815(GR)
Q152	2210746 or	2SC945A(P) or
	2212485	JC501(Q)
Q151,Q153	2211256	2SC1815(BL)
Q202,Q203	2212794,	2SD1468(R),
	2211705 or	2SD655(E) or
	2211706	2SD655(F)
Q204,Q322	2211455,	2SA1015(GR),
	2210803 or	2SA733(P) or
	2212495	JA101(Q)
Q302,Q402	2211945	2SK246(GR)
Q701	2211255	2SC1815(GR)
Q702	2212294 or	2SK108(D) or
	2211293	2SK68(M)
Q705,Q707	2211255,	2SC1815(GR),
Q709-Q711	2210746 or	2SC945A(P) or
Q801-Q805	2212485	JC501(Q)
Q706,Q708	2211256	2SC1815(BL)
Q712,Q713	2211255,	2SC1815(GR),
	2210746 or	2SC945A(P) or
	2212485	JC501(Q)
Q714	2211455,	2SA1015(GR),
	2210803 or	2SA733(P) or
	2212495	JA101(Q)
	Diodes	
D101,D102	223132	1K60
D104,D152	223150,	US1040,
D153,D201	223124 or	1S2473 or
D301,D401	223145	1S2076TD
D321-D324	223150,	US1040,
D701-D703	223124 or	1S2473 or
D803-D808	223145	1S2076TD
D801,D802	223155	1SS138
D951	2243152 or	MTZ5.6B or
	2239472	RD5.6EB2
	Coils	
L001	233312	NMA-3051
L102	233105	NCH-1005
L201	233236	NMC-6027
L202,L203	233291	NMC-5039
	Transformer	
L101	233351	NFIF-4056
	RF block	
L151	232128	NMRF-7043
	X'tal	
X701	3010073	XTL-7.2M

CIRCUIT NO.	PART NO.	DESCRIPTION
	Ceramic filters	
X101	3010070	SFE10.7MS3GYA
X102	3010043	SFE10.7MM
X151	3010075	SFL450B3
X152	3010076	BFU450C
	Capacitors	
C002	352780339	3.3 μF,50V,Elect.
C107	352742209	22μF,16V,Elect.
C108	352784799	0.47μF,50V,Elect.
C111	352741009	10μF,16V,Elect.
C112	352780229	2.2 μF,50V,Elect.
C116	352782299	0.22μF,50V,Elect.
C152,C155	352741009	10μF,16V,Elect.
C156	352750479	4.7 μF,25V,Elect.
C157	352741009	10μF,16V,Elect.
C159	352780109	1 μF,50V,Elect.
C161	352780229	2.2 μF,50V,Elect.
C162	352721019	100 μF, 6.3V,Elect.
C201	352750479	4.7 μF,25V,Elect.
C202	352744719	470 μF,16V,Elect.
C206,C207	352741009	10μF,16V,Elect.
C208,C209	352780109	1 μF,50V,Elect.
C210	352782299	0.22μF,50V,Elect.
C212	352780339	3.3 μF,50V,Elect.
C213	352780109	1 μF,50V,Elect.
C214	370134714	470pF ±5%,50V,APS
C302	352780229	2.2 μF,50V,Elect.
C304	352721019	100 μF, 6.3V,Elect.
C308	352780229	2.2 μF,50V,Elect.
C325,C326	352742219	220 μF,16V,Elect.
C327	352784799	0.47μF,50V,Elect.
C329	352750479	4.7 μF,25V,Elect.
C402	352780229	2.2 μF,50V,Elect.
C404	352721019	100 μF, 6.3V,Elect.
C408	352780229	2.2 μF,50V,Elect.
C702	352741009	10μF,16V,Elect.
C703	395160107	1 μF,35V,Tantalum
C708	352734709	47μF,10V,Elect.
C711	352780109	1 μF,50V,Elect.
C712	352780229	2.2 μF,50V,Elect.
C713	352780479	0.47μF,50V,Elect.
C715	3020017	0.022F,5V,Super
C801,C802	352741009	10μF,16V,Elect.
C951	352741009	10μF,16V,Elect.
	Resistors	
R154	5215045	N08HR10KBC,Semi-fixed
R156	5215062	N08HR30KBC,Semi-fixed
R205	5215049	N08HR500KBC,Semi-fixed
R215	5215044	N08HR5KBC,Semi-fixed
R951	441521114	110ohm,1/2W,Metal oxide film
	Socket	
	25050273	NSCT-9P101
	Terminals	
P301-P303	25045171	NPJ-4PDBL-65,Input/Output
P901	25060087	NTM-2PDMN31,Antenna
	Bracket	
	27141059	Ground

TX-7320

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE



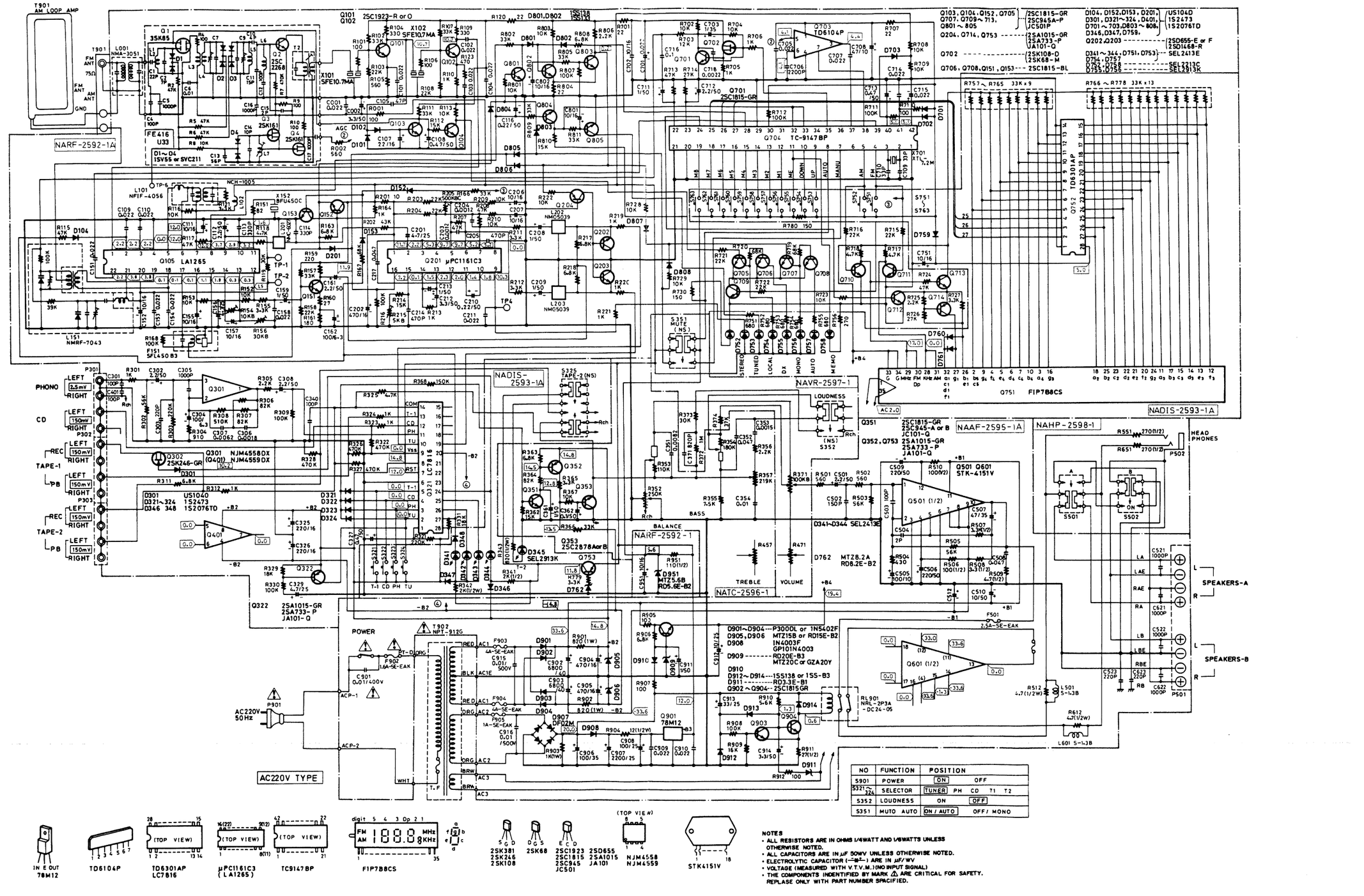
PRINTED CIRCUIT BOARD–PARTS LIST

POWER AMPLIFIER PC BOARD (NAAF-2595-1A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q501,Q601	222044	STK-4151V
Q901	222780122	78M12
	Transistors	
Q902-Q904	22112555	2SC1815(GR)
	Diodes	
D901-D904	223897 or	P3000DL or
	22380003	1N5402F
D905,D906	2243252 or	MTZ15B or
	2239672	RD15E-B2
D907	223892	DF02M
D908	223896 or	1N40003F or
	223880	GP101N4003
D909	2239733,	RD20E-B3,
	2243283 or	MTZ20C or
	2241212	GZA20Y
D910	223155	1SS138
D911	2241291	RD3.3E-B1
D912-D914	223155	1SS138
	Coils	
L501,L601	231001	S-1.3B
	Capacitors	
C501,C601	352780229	2.2 μF,50V,Elect.
C505,C605	352731019	100 μF,10V,Elect.
C506	352782219	220 μF,50V,Elect.
C507,C607	352764709	47μF,35V,Elect.
C509	352782219	220 μF,50V,Elect.
C512,C514	352781009	10μF,50V,Elect.
C901	3500065A	⚠DE7150FZ103PAC400V/125V,IS
C902,C903	3504171	6,800 μF,40V,Elect.
C904,C905	352744719	470 μF,16V,Elect.
C906	352761019	100 μF,35V,Elect.
C907	352752229	2,200 μF,25V,Elect.
C908	352751019	100 μF,25V,Elect.
C911	352780109	1 μF,50V,Elect.
C510,C912	352751009	10μF,25V,Elect.
C913	352753309	33μF,25V,Elect.
C914	352780339	3.3 μF,50V,Elect.
	Resistors	
R506	441521014	100ohm,1/2W,Metal oxide film
R507,R607	441523324	3.3kohm,1/2W,Metal oxide film
R508,R608	441523324	3.3kohm,1/2W,Metal oxide film
R509,R609	441520474	4.7ohm,1/2W,Metal oxide film
R510	441521014	100ohm,1/2W,Metal oxide film
R512,R612	441520474	4.7ohm,1/2W,Metal oxide film
R901,R902	441628214	820ohm,1W,Metal oxide film
R903	441621024	1kohm,1W,Metal oxide film
R904	441521204	12ohm,1/2W,Metal oxide film
R911	441522704	27ohm,1/2W,Metal oxide film
	Relay	
RL901	25065108	NRL-2P3A-DC24-05
	Switch	
S901	25035398	⚠NPS-111-L362P,Power
	Terminal	
P501	25060094	NTM-8P-DML-35,Speaker
	Fuseholders	
	25050065	⚠YSH403T
	Sockets	
	25050268	NSCT-4P-96
	25050269	NSCT-5P-97
	Radiator	
	27160176	RAD-56
	Screw	
	82143006	3P+6F(BC),Pan head screw
	Brackets	
	25060092	NTM-1S33
	Label	
	29360405	T2.5A/250V,Fuse rating
	Fuses	
F902	252073 or	⚠1.6A-SE-EAK,Primary
	252073CC	
F903,F904	252077	⚠4A-SE-EAK,Secondary
F905	252070	⚠1A-SE-EAK,Secondary
F501,F601	252075	⚠2.5A-SE-EAK,Speaker

NOTE:THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

SCHEMATIC DIAGRAM



NO	FUNCTION	POSITION
S901	POWER	[ON] OFF
S321~324	SELECTOR	[TUNER] PH CD T1 T2
S352	LOUDNESS	ON [OFF]
S351	MUTE AUTO	[ON / AUTO] OFF / MONO

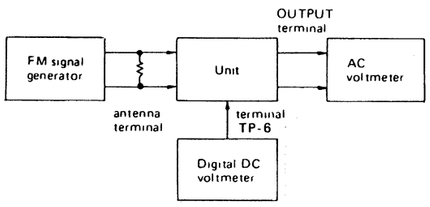
NOTES
- ALL RESISTORS ARE IN OHMS 1/4WATT AND 1/8WATTS UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN μF 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITOR (—|(+)|—) ARE IN μF/WV
- VOLTAGE (MEASURED WITH V.T.V.M.) (NO INPUT SIGNAL)
- THE COMPONENTS INDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLASE ONLY WITH PART NUMBER SPACIFIED.

ONKYO CORPORATION

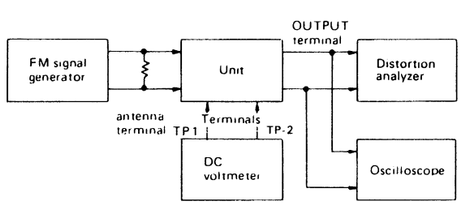
ADJUSTMENT PROCEDURES

FM section

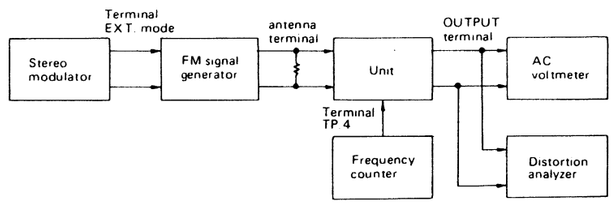
Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuning frequency	Output indicator	Adjustment point	Adjust for	Remarks
Front end	1	Fig.1	———	———	88.00MHz	Digital DC voltmeter	T1(L5)	1.5V±0.4V	Usually not necessary to adjust.
	2		107.9MHz 1kHz,75kHz devi.	———	107.90MHz	AC voltmeter	TC1,TC2	Maximum output	
I F	1	Fig.2	99.0MHz 1kHz,75kHz devi. 65dBf(60dB)	———	99.00MHz	DC voltmeter	L101 Primary	0V	Set the muting switch to OFF. Repeat the steps 1 and 2 until no further adjustment is necessary.
	2					Distortion analyzer	L101 Secondary	Minimum	
V C O		Fig.3	99.0MHz 1kHz,75kHz devi. 65dBf(60dB)	———	99.00MHz	Frequency counter	R215	19kHz±10Hz	Set the muting switch to ON.
Stereo distortion		Fig.3	99.0MHz Ext. modulation 65dBf(60dB)	L+R 1kHz 67.5kHz devi.	99.00MHz	Distortion analyzer	T2	Minimum	
Stereo separation	1	Fig.3	99.0MHz Ext. modulation 65dBf(60dB)	Lch. 1kHz	99.00MHz	Rch. AC voltmeter	R205	Minimum	Maximum and same separation
	2			Rch. 1kHz		Lch. AC voltmeter		Minimum	
Tuning indicator level	1	Fig.2	99.0MHz 1kHz,75kHz devi. 29.2dBf(24dB)	———	99.00MHz	Tuning indicator	R156	Light on	
	2		99.0MHz 1kHz,75kHz devi. 28.2dBf(23dB)	———				Light off	



〈Fig.1〉



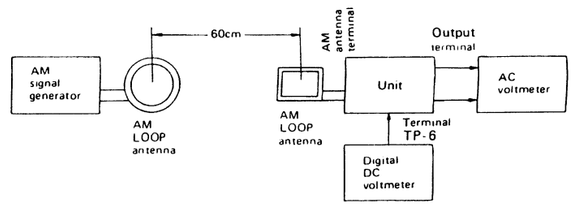
〈Fig.2〉

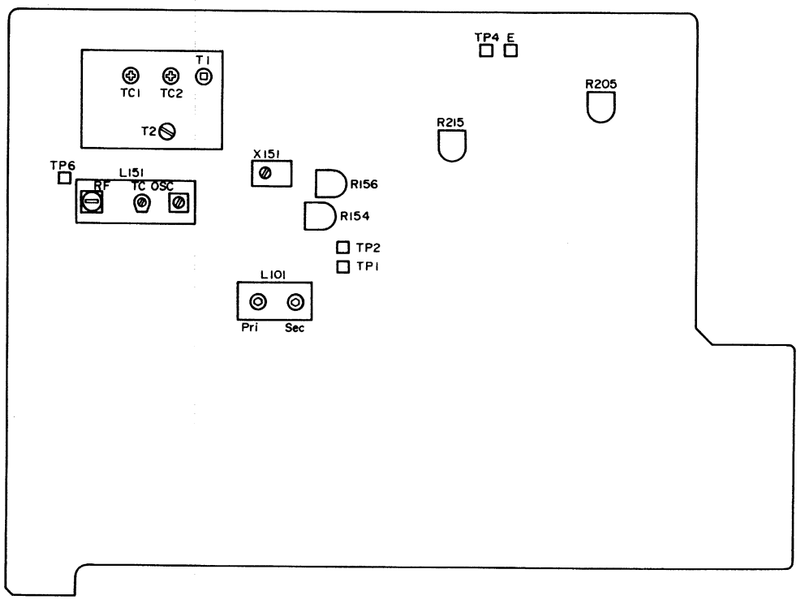


〈Fig.3〉

AM section

Step	AM SG output	Tuning Frequency	Output indicator	Adjustment point	Adjust for	Remarks
1	———	522kHz	Digital DC voltmeter	L151 OSC	1.2V±0.1V	Usually not necessary to adjust.
2	603kHz,60dB/m 400Hz 30% mod.	603kHz	A C voltmeter	L151 R F	Maximum	Repeat the steps 2 and 3 until no further adjustment is necessary.
3	1404kHz,60dB/m 400Hz 30% mod.	1404kHz		L151 T C	Maximum	
4	999kHz,30dB/m 400Hz 30% mod.	999kHz	A C voltmeter	X151	Maximum	
5	999kHz,30dB/m 400Hz 30% mod.	999kHz	TUNED indicator	R154	Light on	



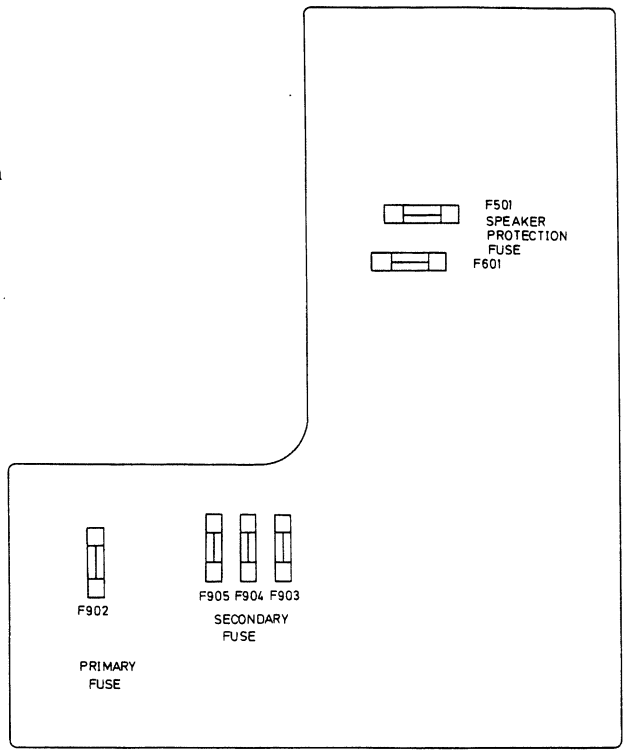


SERVICE PROCEDURES

1.Replacing the fuses

For continued protection against fire hazard,replace only with same type and same rating fuse.

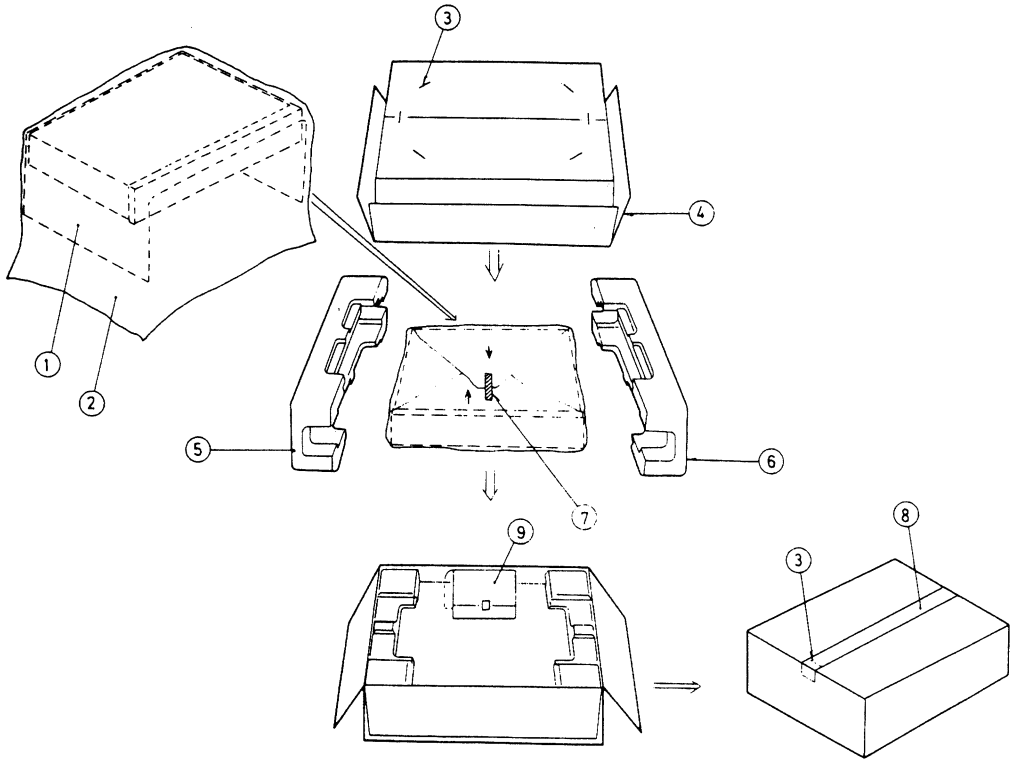
Circuit no.	Part no.	Description
F501,F601	252075	2.5A-SE-EAK,Speaker protection
F902	252073	1.6A-SE-EAK,Primary
F903,F904	252077	4A-SE-EAK,Secondary
F905	252070	1A-SE-EAK,Secondary



2.Memroy preservation

This unit does not require memory preservation batteries. A built-in memory power back-up system preserves contents of the memory during power failures and even when the unit is unplugged. The unit must be plugged in and the power switch turned on and off once in order to charge the back-up system. Note that since this is not a permanent memory,the power switch must be turned on and off a few times each month to keep the back-up system operative. The period of time during which memory contents are preserved after power has last been turned off varies depending on climate and placement of the unit. On the average, memory contents are protected over a period of 3 to 4 weeks (a minimum of 2 weeks) after the last time power has been turned off. This period is shorter when the unit is exposed to very high humidity or used in an area with an extremely humid climate.

PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29095012-1	500 ×800mm,Protection sheet <B>
2	29100036A	550 ×850mm,Poly-vinyl bag
3	282301	Sealing hook
4	29051287	Master carton box <S>
	29051288	Master carton box <B>
5	29090690C	Pad R
6	29090691B	Pad L
7	29110032	W=15mm,Adhesive tape
8	260012	W=50mm,Damplon tape
9	Accessory bag ass'y	
	292092	FM antenna
	29340988	Instruction manual
	232119	NMA-3052,AM loop antenna
	29365016B	Warranty card
	29100006A	250 ×350mm,Poly-vinyl bag

NOTE: <B>:Only black model
<S>:Only silver model

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